



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,584	01/15/2004	Takatoshi Ono	2004_0043A	4927
513 7590 04/02/2007 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			EXAMINER BODDIE, WILLIAM	
			ART UNIT 2629	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/02/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/757,584

Applicant(s)

ONO ET AL.

Examiner

William L. Boddie

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,5-7 and 10-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-7 and 10-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)             |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application   |
| Paper No(s)/Mail Date ____   | 6) <input checked="" type="checkbox"/> Other: <u>JP 2000-226641</u> |

### DETAILED ACTION

1. In an amendment dated, January 9<sup>th</sup>, 2007, the Applicants amended claims 1, 5-7 and 10-15, cancelled claims 2-4 and 8-9 and finally added new claims 16-28. Currently claims 1, 5-7 and 10-28 are pending.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890).

**With respect to claim 1**, Eleyan discloses, a trackball device (fig. 13) comprising:

- a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
- a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);
- a rotation detector configured to detect rotation of said sphere (94 in fig. 14);
- a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and
- an informer (106 in fig. 13-14) including electromagnet pole pieces (a-j in fig. 13), said informer being configured to generate auxiliary information responsive to rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);

wherein said support includes at least a first, second and third supporting member (36 and each 94 in fig. 14) each supporting member being independent of said electromagnet.

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Eleyan and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the supports (94 in fig. 14, Eleyan) to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

**With respect to claim 7**, Eleyan and Hallen discloses, the trackball device of claim 1 (see above).

Eleyan further discloses, wherein a direction of the magnetic flux generated by the electromagnet is alternately switched (col. 8, lines 36-44).

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890) and further in view of Bruneau et al. (US 2002/0054011).

**With respect to claim 10**, Eleyan discloses, a trackball device (fig. 13) comprising:

- a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
- a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);
- a rotation detector configured to detect rotation of said sphere (94 in fig. 14);
- a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and
- an informer (106 in fig. 13-14) including electromagnet pole pieces (a-j in fig. 13), said informer being configured to generate auxiliary information responsive to rotating of

Art Unit: 2629

said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);

wherein said support includes at least a first, second and third supporting member (36 and each 94 in fig. 14) each supporting member being independent of said electromagnet.

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively. Eleyan also fails to disclose at least one switch disposed around said trackball device.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Eleyan and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the supports (94 in fig. 14, Eleyan) to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

Bruneau discloses, an input device comprising:

a trackball device (fig. 2) comprising:

at least a first switch disposed around the trackball device (16a/b in fig. 1);

a sphere (15 in fig. 2);

a support for rotatably supporting the sphere (52,40 in fig. 2);

a rotation detector for detecting rotation of the sphere (54 in fig. 2);

a controller for generating a specific output signal responsive to a signal from the rotation detector (210 in fig. 5); and

an informer (148, 150, 18) for generating auxiliary information responsive to rotating of the sphere, the auxiliary information being based on the signal from the controller (para. 11).

Bruneau, Eleyan and Hallen are analogous art because they are all from the same field of endeavor namely, electromagnetic feedback devices.

Art Unit: 2629

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the switches, taught by Bruneau, around the trackball device of Eleyan and Hallen.

The motivation for doing so would have been to allow the user to provide additional commands to a computer system (Bruneau; col. 4, lines 12-15).

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890) further in view of Yokoji et al. (US 6,909,422).

**With respect to claim 5**, Hallen and Eleyan disclose, the trackball device of claim 1 (see above).

Neither Hallen nor Eleyan disclose that the sphere and the supporting members are made from the same material.

Yokoji discloses, a trackball with a sphere (308 in fig. 19) and supporting members (326a, 325a in fig. 19) who are all formed from with an elastic surface material (col. 7, lines 60-65; col. 21, lines 42-46).

Yokoji, Hallen and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to coat the surface of the sphere and support elements of Eleyan and Hallen with the with the same elastic material taught by Yokoji.

The motivation for doing so would have been to obtain an easy-to-manipulate track ball (Yokoji; col. 7, lines 63-65).

Art Unit: 2629

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890) further in view of Mailey et al. (US 5,237,311).

**With respect to claim 6**, Hallen and Eleyan disclose, the trackball device of claim 1 (see above).

Neither Hallen nor Eleyan disclose, a switch operated by depression of the sphere.

Mailey discloses, the inclusion of a switch (b in fig. 1), which is operated by depression of a sphere (10 in fig. 1) in relation with a third supporting member (42 in fig. 1; also note the abstract discussion of the transducer).

Mailey, Hallen and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the third supporting member of Eleyan and Hallen with the switch controlling support member taught by Mailey.

The motivation for doing so would have been, the elimination of awkward finger movements to actuate a switch (Mailey; col. 2, lines 5-9).

7. Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890) further in view of Ideno (JP 64-24447).

**With respect to claim 11**, Eleyan discloses, a trackball device (fig. 13) comprising:

Art Unit: 2629

a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);  
a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);  
a rotation detector configured to detect rotation of said sphere (94 in fig. 14);  
a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and  
an informer (106 in fig. 13-14) including electromagnet pole pieces (a-j in fig. 13), said informer being configured to generate auxiliary information responsive to rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);  
wherein said support includes at least a first, second and third supporting member (36 and each 94 in fig. 14) each supporting member being independent of said electromagnet.  
wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively. Eleyan also fails to disclose a providing a trackball device in a vehicle cabin.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

Art Unit: 2629

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Eleyan and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the supports (94 in fig. 14, Eleyan) to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

Ideno discloses, a vehicle comprising:

a vehicle body having a vehicle cabin therein (fig. 1);

a drive wheel supporting the vehicle body (the inclusion of a drive wheel is inherent in the design of a vehicle); and

a trackball device provide in the vehicle cabin (2 in fig. 1).

Ideno, Hallen and Eleyan are analogous art because they are both from the same field of endeavor namely the design and operation of rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the trackball device of Eleyan and Hallen in a vehicle as taught by Ideno.

The motivation for doing so would have been to enhance the interaction between drivers and the onboard computer system (Eleyan; col. 2, lines 50-53).

**With respect to claim 12**, Eleyan, Hallen and Ideno disclose, the vehicle of claim 11 (see above).

Eleyan further discloses, a second controller (42 in fig. 2) configured to receive the signal from said first controller (clear from fig. 2); and

electronic equipment configured to be controlled by said second controller (46 in fig. 2).

**With respect to claim 13**, Eleyan, Hallen and Ideno disclose, the vehicle of claim 11 (see above).

Eleyan further discloses, wherein said electronic equipment includes a display (46 in fig. 2) for displaying a cursor (44 in fig. 2), and rotation of said sphere causes movement of the cursor on the display (col. 4, lines 1-13).

**With respect to claim 14**, Eleyan, Hallen and Ideno disclose, the vehicle of claim 11 (see above).

Ideno further discloses, wherein said trackball device is disposed in a central position of a full width of said vehicle cabin (clear from figs. 1 and 4).

**With respect to claim 15**, Eleyan, Hallen and Ideno disclose, the vehicle of claim 11 (see above).

Ideno further discloses, two seats in a front portion of said vehicle cabin, wherein said trackball device is disposed between said two seats (once again this is clear from figs. 1 and 4).

8. Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978).

**With respect to claim 16**, Eleyan discloses, a trackball device (fig. 13) comprising:

- a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
  - a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);
  - a rotation detector configured to detect rotation of said sphere (94 in fig. 14);
  - a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and
  - an informer (106 in fig. 13-14) including electromagnet pole pieces (a-j in fig. 13), said informer being configured to generate auxiliary information responsive to rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);
- wherein said support includes at least a first, second and third supporting member (36 and each 94 in fig. 14) each supporting member being independent of said electromagnet.

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59).

**With respect to claim 21**, Eleyan and Mimlitch discloses, the trackball device of claim 16 (see above).

Eleyan further discloses, wherein a direction of the magnetic flux generated by the electromagnet is alternately switched (col. 8, lines 36-44).

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) further in view of Tuovinen et al. (US 6,509,888).

**With respect to claim 17**, Eleyan and Mimlitch disclose, the trackball device of claim 16 (see above).

Neither Eleyan nor Mimlitch expressly disclose, that the permanent magnet is located so that a direction of magnetic lines generated by said permanent magnet coincides with a direction of magnetic lines generated by said electromagnet.

Tuovinen discloses, a roller input device (fig. 12b) wherein a permanent magnet (6 in fig. 1a) is located so that a direction of magnet lines (m in fig. 1a) generated by said permanent magnet coincide with a direction of magnetic lines generated by an electromagnet (41 in fig. 12b).

Tuovinen, Mimlitch and Eleyan are analogous art because they are both from the same field of endeavor namely, rotatable magnetic input devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to orient the permanent magnet of Mimlitch and Eleyan in the same direction as the electromagnet, as taught by Tuovinen.

The motivation for doing so would have been to not inadvertently counteract any feedback generated by said informer, thereby ensuring the maximum amount of feedback to the user possible.

Art Unit: 2629

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) further in view of Hallen et al. (US 6,518,890).

**With respect to claim 18**, Eleyan and Mimlitch disclose, the trackball device of claim 16 (see above).

Neither Eleyan nor Mimlitch expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Eleyan, Mimlitch and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the supports (94 in fig. 14, Eleyan) of Eleyan and Mimlitch to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) and Hallen et al. (US 6,518,890) further in view of Yokoji et al. (US 6,909,422).

**With respect to claim 19**, Eleyan, Mimlitch and Hallen disclose the trackball device of claim 18 (see above).

Neither Hallen, Mimlitch nor Eleyan disclose that the sphere and the supporting members are made from the same material.

Yokoji discloses, a trackball with a sphere (308 in fig. 19) and supporting members (326a, 325a in fig. 19) who are all formed from with an elastic surface material (col. 7, lines 60-65; col. 21, lines 42-46).

Yokoji, Hallen, Mimlitch and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to coat the surface of the sphere and support elements of Eleyan, Mimlitch and Hallen with the with the same elastic material taught by Yokoji.

The motivation for doing so would have been to obtain an easy-to-manipulate track ball (Yokoji; col. 7, lines 63-65).

Art Unit: 2629

12. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) and Hallen et al. (US 6,518,890) further in view of Mailey et al. (US 5,237,311).

**With respect to claim 20**, Eleyan, Mimlitch and Hallen disclose the trackball device of claim 18 (see above).

Neither Hallen, Mimlitch nor Eleyan disclose, a switch operated by depression of the sphere.

Mailey discloses, the inclusion of a switch (b in fig. 1), which is operated by depression of a sphere (10 in fig. 1) in relation with a third supporting member (42 in fig. 1; also note the abstract discussion of the transducer).

Mailey, Hallen, Mimlitch and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the third supporting member of Eleyan, Mimlitch and Hallen with the switch controlling support member taught by Mailey.

The motivation for doing so would have been, the elimination of awkward finger movements to actuate a switch (Mailey; col. 2, lines 5-9).

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) and further in view of Bruneau et al. (US 2002/0054011).

**With respect to claim 22**, Eleyan discloses, a trackball device (fig. 13) comprising:

Art Unit: 2629

a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);

a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);

a rotation detector configured to detect rotation of said sphere (94 in fig. 14);

a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and

an informer (106 in fig. 13-14) including electromagnet pole pieces (a-j in fig. 13), said informer being configured to generate auxiliary information responsive to rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);

wherein said support includes at least a first, second and third supporting member (36 and each 94 in fig. 14) each supporting member being independent of said electromagnet.

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere. Eleyan also fails to disclose at least one switch disposed around said trackball device.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59).

Bruneau discloses, an input device comprising:

a trackball device (fig. 2) comprising:

at least a first switch disposed around the trackball device (16a/b in fig. 1);

a sphere (15 in fig. 2);

a support for rotatably supporting the sphere (52,40 in fig. 2);

a rotation detector for detecting rotation of the sphere (54 in fig. 2);

a controller for generating a specific output signal responsive to a signal from the rotation detector (210 in fig. 5); and

an informer (148, 150, 18) for generating auxiliary information responsive to rotating of the sphere, the auxiliary information being based on the signal from the controller (para. 11).

Bruneau, Eleyan and Mimlitch are analogous art because they are all from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the switches, taught by Bruneau, around the trackball device of Eleyan and Mimlitch.

The motivation for doing so would have been to allow the user to provide additional commands to a computer system (Bruneau; col. 4, lines 12-15).

14. Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) and further in view of Ideno (JP 64-24447).

**With respect to claim 23**, Eleyan discloses, a trackball device (fig. 13) comprising:

- a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
  - a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);
  - a rotation detector configured to detect rotation of said sphere (94 in fig. 14);
  - a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and
  - an informer (106 in fig. 13-14) including electromagnet pole pieces (a-j in fig. 13), said informer being configured to generate auxiliary information responsive to rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);
- wherein said support includes at least a first, second and third supporting member (36 and each 94 in fig. 14) each supporting member being independent of said electromagnet.

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere. Eleyan also fails to disclose at least one switch disposed around said trackball device.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59).

Ideno discloses, a vehicle comprising:

a vehicle body having a vehicle cabin therein (fig. 1);

a drive wheel supporting the vehicle body (the inclusion of a drive wheel is inherent in the design of a vehicle); and

a trackball device provide in the vehicle cabin (2 in fig. 1).

Ideno, Mimlitch and Eleyan are analogous art because they are both from the same field of endeavor namely the design and operation of rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the trackball device of Eleyan and Mimlitch in a vehicle as taught by Ideno.

The motivation for doing so would have been to enhance the interaction between drivers and the onboard computer system (Eleyan; col. 2, lines 50-53).

**With respect to claim 24**, Eleyan, Mimlitch and Ideno disclose, the vehicle of claim 23 (see above).

Eleyan further discloses, a second controller (42 in fig. 2) configured to receive the signal from said first controller (clear from fig. 2); and

electronic equipment configured to be controlled by said second controller (46 in fig. 2).

**With respect to claim 25**, Eleyan, Mimlitch and Ideno disclose, the vehicle of claim 23 (see above).

Eleyan further discloses, wherein said electronic equipment includes a display (46 in fig. 2) for displaying a cursor (44 in fig. 2), and rotation of said sphere causes movement of the cursor on the display (col. 4, lines 1-13).

**With respect to claim 26**, Eleyan, Hallen and Ideno disclose, the vehicle of claim 23 (see above).

Ideno further discloses, wherein said trackball device is disposed in a central position of a full width of said vehicle cabin (clear from figs. 1 and 4).

**With respect to claim 27**, Eleyan, Mimlitch and Ideno disclose, the vehicle of claim 23 (see above).

Ideno further discloses, two seats in a front portion of said vehicle cabin, wherein said trackball device is disposed between said two seats (once again this is clear from figs. 1 and 4).

15. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Susumu (JP 2000-226641).

**With respect to claim 28**, Eleyan discloses, a trackball device (fig. 13) comprising:

- a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
- a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);
- a rotation detector configured to detect rotation of said sphere (94 in fig. 14);
- a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and
- an informer (106 in fig. 13-14) including electromagnet pole pieces (a-j in fig. 13), said informer being configured to generate auxiliary information responsive to rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);

wherein said support includes at least a first, second and third supporting member (36 and each 94 in fig. 14) each supporting member being independent of said electromagnet.

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, that the sphere is formed of one of martensite stainless steel and ferrite stainless steel.

Susumu discloses, forming small spheres out of martensite stainless steel (solution).

Susumu and Eleyan are analogous art because they are both from the same field of endeavor namely the design and manufacturing small metallic spheres.

At the time of the invention it would have been obvious to one of ordinary skill in the art to construct the sphere of Eleyan out of martensite stainless steel as taught by Susumu.

The motivation for doing so would have been for the well-known corrosion resistance properties of martensitic stainless steel (Susumu; problem to be solved).

### ***Conclusion***

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 2629

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

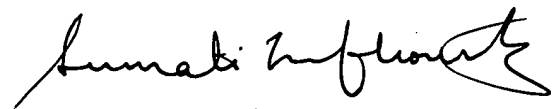
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb  
3/28/07



**SUMATI LEFKOWITZ**  
**SUPERVISORY PATENT EXAMINER**